

4455

Form 504

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

State: California

11-5813

DESCRIPTIVE REPORT.

~~Hydrographic~~ Sheet No. 4455

LOCALITY:

Monterey Bay

Pt. Santa Cruz to Vic. of

Pt. Ano Nuevo

1924 - 5

CHIEF OF PARTY:

C. L. Garner

4455

NOTE

This projection was not made on regular Whatman's paper because it was too small to take in the required signals.

DESCRIPTIVE REPORT

to accompany

HYDROGRAPHIC SHEET NO. 1, NORTH END MONTEREY BAY, CALIFORNIA

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Instructions dated October 6 and December 20, 1924. Comd L.
Garner, Commanding U. S. S. DISCOVERER

GENERAL.

The hydrography included on this sheet covers an area of approximately 200 square statute miles to the south and west of Santa Cruz, where a complete development of this section of the coast was made almost entirely with tube soundings.

The natural features of the coast line are about as shown on existing charts and as described in the Coast Pilot except in a few instances erosion is noticeable, and there are no off shore or inshore dangers if at a distance of $3/4$ mile from the coast line. In general the reefs with less than 6 or 8 fathoms depth are kelp marked and are very close to the breakers.

CONTROL.

Because of a scarcity of recoverable triangulation stations in this vicinity it was necessary to determine topographically and hydrographically several signals in the area between Santa Cruz and Point Ano Nuevo for control of the hydrography. None of the triangulation stations of the scheme following the coast to the northwest of Santa Cruz could be found and as the determination of stations by triangulation would have necessitated another scheme and would have greatly delayed the hydrographic work the only practical course was to determine the location of signals as stated above.

Of these signals, hydrographic stations DER, COW, SLAW, MAST, FLAG and HIGH were determined by plane table traverse and triangulation. Hydrographic signals BARE, CEMENT, and TANK were determined by a combination of stadia traverse and sextant cuts from the ship, while hydrographic signal RED was located entirely by sextant cuts. As the stadia traverse to CEMENT could not be entirely relied upon because of a long traverse with no tie at that end, a detailed delineation of a section of the coast line in that vicinity was made with CEMENT relatively located and with this superimposed over the shore line as shown on the bromide of the original topographic sheet it is believed that the located was well determined. The two shore lines agreed well and as this section

of the coast is practically all rock it would not seem that the erosion has been more than a few meters at most. With this location the sextant cuts were in fair accord. Signal SAND, is a conspicuous sand dune and was taken from a bromide of the revised topography of 1910. DOCK is ~~also~~ from 1910 *Chart # 5403* topography.

As there is no topographic sheet of this area a list of these objects is attached hereto in case they should be of use in future work.

TUBE SOUNDINGS, ETC.

Practically all of the soundings were made with tubes with daily comparative readings made in compliance with circular No. 54 of June 27, 1924. In a few instances tubes were lost before any comparisons could be made but these are very few and when this did occur it usually happened that one of the tubes of the pair had been or was later compared. If the agreements were good the sounding was not rejected in the records and it is recommended that they be accepted. On the whole comparisons in deep water, when the lead was not on the bottom, are much better than with the up and down soundings. This is particularly true in shallow water and is probably due to the uncertainty of the tube actually reaching the bottom (The tubes were about 4 feet above the lead) and because of the roll of the ship.

RESULTS.

The soundings as obtained show a gently sloping bottom, usually of sand, sometimes very hard, with occasional indications of rock. The slope is almost constant until a depth of 60 fathoms is reached when it is much steeper and at 100 fathoms it is quite steep to 300 and sometimes 400 fathoms. The crossed soundings do not differ by more than the allowable limits of accuracy of the tubes and on the whole are believed to be entirely satisfactory.

CHANGES.

Of particular significance is the difference of depth between the present and the old depths as now shown on the chart. There is a constant discrepancy of about 3 fathoms between the old and the new depths at the 20-fathom curve while the difference varies from 4 to 6 fathoms out at the 75-fathom curve and it is important to note that there is not a single exception noted on the sheet. A complete comparison of depths inshore has been impossible for want of time in which to complete field records and this would be only partially possible in any event since the present soundings were not carried in less than 15 fathoms.

In this connection it is also pertinent to cite the difference ^{of} values for mean sea level as referred to an old

bench mark at Santa Cruz, then and now. It is unfortunate that this was the only bench mark there and while it was reported surely identified there was some chance of not locating the exact spot.

TIDE GAUGE.

The Santa Cruz tide station was used for the reduction of soundings for the area covered by this sheet. No attempt was made to establish a gauge in the vicinity of Point Ano Nuevo because any tide gauge or staff established there would not last. There is not sufficient protection for a tide gauge unless considerable time and expense were spent in establishing one.

Quite appreciable current sets were noticed while engaged in this work but during fair weather they are apparently almost entirely tidal.

Respectfully submitted,

Clem L. Garner---

CLEM L. GARNER, H. & G. Engr.
Commanding USS DISCOVERER.

Table of Statistics to Accompany Sheet No. _____

Date	Letter	Volume	Positions	Soundings	Miles(Statute)	Vessel
Nov 12, 1924.	A	I	34	106	23.4	Ship
Nov 25	B	I	56	196	44.0	"
Nov 29	C	1&2	46	152	34.2	"
Dec 1	D	2	27	86	14.2	"
Dec 2	E	2	46	142	29.0	"
Dec 3	F	2	49	159	30.5	"
Dec 4	G	3	6	19	1.4	"
Dec 9	H	3	57	190	31.2	"
Dec 10	J	3	81	217	46.0	"
Dec 11	K	3&4	87	270	42.3	"
Dec 12	L	4	94	266	47.0	"
Dec 13	M	5	34	108	17.8	"
Dec 19	N	5	73	212	40.0	"
Dec 20	P	5&6	64	187	33.7	"
Jan 6, 1925.	Q	6	92	264	46.9	"
Jan 7	R	6&7	91	269	44.3	"
Jan 8	S	7	76	238	36.8	"
Jan 13	T	7	8	30	4.5	"
Jan 16	U	7&8	108	334	51.8	"
Jan 17	V	8	53	155	23.0	"
Feb 6	W	8	51	132	21.7	"
Feb 9	X	9	84	215	32.0	"
Totals			1317	3947	1090.4	

Soundings in fathoms ✓

Plane of reference , M.L.L.W ✓

Tidal guage located at Santa Cruz, Cal, on Municipal Wharf.

M.L.L.W. equals 6.9 feet above the zero of the staff.

Lowest tide observed, reading on guage, 5.0 feet.

Highest tide observed, reading on guage, 14.2 feet.

TOPOGRAPHIC SIGNALS

Name of Signal	Lat.	D.M.	Long.	D.P.	Height	Remarks
Pt. Avo Nuevo L.H.	37°-06'	Meters 998	122° 20'	Meters 248	125 Ft. (7)	Light Tower.
Tank	37 01	351	122 12	526	75 "	Center
Cement	37 00	1745	122 11	1204	150 "	SW gable of center tall storage bldg.
Base	37 00	878	122 06	856	700 " Ap	Highest westerly bare part of large bare hill.
White	36 58	662	122 07	977	60 "	SW gable of white dwelling.
Derrick	36 57	767	122 05	937	90 "	Oil derrick.
Mast	36 56	1750	122 03	1208	30 "	Mast of wreck.
High	36 58	1416	122 03	266	250 "Ap	SW gable of barn
Dock	36 57	829	122 01	44	50 "	S. Gable of dock. (From chart #5403)
Cap (Capitol Hotel- Staff)	36-58	634	121-56	1468		(From 1910 topog.0)
Hydrographic Signals						
Red	37-06	492	122-17	42	350 Ft.	Approx. Top of west of two high bare land slide bluffs at shore line.

field records.

~~Division of Hydrography and Topography:~~

June 19, 1925.

Division of Charts:

Tide reducers are approved in
volumes of sounding records for

HYDROGRAPHIC SHEET

4453

Locality:

Monterey Bay, vicinity of Santa Cruz, Calif.

Chief of Party:

Oliver L. Garner in 1924-1925.

Plane of reference is

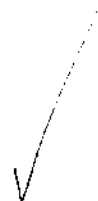
6.9 ft. on tide staff at ~~mean~~ lower low water and is
Santa Cruz, Calif.

For reduction of soundings, condition of records satisfactory.
except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of each day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks



Chief, Division of Tides and Currents.



DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

WASHINGTON January 7, 1926.

Verification Report for H. 4555

Monterey Bay, California

1. The records conform to the requirements of the General Instructions except that more bottom characteristics should have been taken. This is particularly true of B day. It should be noted that when the records first came in from the field no corrections had been applied to the tube readings. The graphs contained merely the normal 45° line without any curve based on the comparative readings. This was due to a misunderstanding on the part of the field party, they being under the impression that as long as the tube and wire comparisons differed by less than the allowable limit, the corrections could be ignored. The corrections to be applied to the tube readings are, however, for the purpose of taking care of the effect of the thermometric and barometric conditions.

Graphs were constructed and the soundings corrected in the office under the immediate supervision of the Chief of Section of Field ~~Records~~^{Work}. The verifier, therefore, did not go back of the reduced soundings. Practically all the soundings as plotted by the field party were changed by the verifier owing to the above mentioned corrections, and especial care had to be taken in inking on account of there being no check.

The corrections to the tube readings as applied in the office caused many of the irregularities in the depth curves to be smoothed out. There are a few irregularities along the 50 fathom curve, which might have been eliminated if a more accurate graph could have been constructed -- that is, if more comparative readings were taken. In the opinion of the writer more comparative readings should be taken at each depth rather than rely upon one reading at say 30 fathoms and another reading at 40 fathoms and a smooth curve drawn between the two plottings. Several readings should be taken at 30 fathoms and several at 40 fathoms and so on. In this way improbable readings would not enter into the construction of the graph.

2. In several instances tubes were lost before any comparisons could be made. In such cases if there was a close agreement with the companion tube, then the readings of the companion tube were

accepted and corrected from its graph and thus plotted. Frequently the graph of a preceding day was used and corrections applied. In such cases it was assumed by the verifier that the one applying the corrections assured himself that the atmospheric conditions for the two days were practically the same.

3. The entire work on this sheet was based on the three point fix method. In a few instances, only, when signals were not visible, were the positions plotted by course and time.
4. The protracting was well done, although there were some instances of erroneous plotting which indicated that reference was not made to the boat sheet. It is to be observed that the spacing of some of the lines on the smooth sheet (particularly at the northwestern end) does not agree with the more uniform spacing on the boat sheet. This is accounted for by the fact that during the progress of the work the positions of some of the signals (Cement and Red) were changed; so that some of the lines were plotted on the boat sheet with an erroneous location of these signals. The system of lines being followed as originally laid out on the boat sheet, without allowing for the shifting of the lines due to a replotting of the signals, caused the smooth plotting, in which the correct location was used throughout, to differ considerably from the boat sheet, with a consequent result that a number of the lines run very close together. No great harm, however, is done as the bottom along here is fairly even and these unintentional close lines afford a splendid check on the accuracy of the work.
5. The soundings were well plotted, the time intervals being generally adhered to, but as has already been mentioned practically all the soundings had to be changed (in depth) on account of the office corrections.
6. The 30 fathom curve has been inked on this sheet in order to facilitate the work of the compiler, inasmuch as this curve is now shown on Chart 5402. This is a departure from the field instructions but is believed justifiable.
7. This report would hardly be complete without a word being mentioned about the results of the survey, and its relation to future surveying with pressure tubes.

From the inshore limits to the 100 fathom curve the work was almost exclusively tube sounding. An inspection of the crossings, wherever check lines were run, or where the adjacent lines were close enough to afford a fair comparison, reveals the fact that the differences are well within the allowable limits for such depths. In fact the maximum discrepancy at 50 fathoms is about 4% while in less depths the crossings are almost perfect. This is truly remarkable, and it may well be said that this sheet is another proof that the use of pressure tubes has passed from the experimental stage and has become a permanent adjunct in the field of hydrographic surveying.

Respectfully submitted,

A. L. Shalowitz

A. L. Shalowitz
Cartographic Engineer.

Approved -
ALB
L. O. P.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

WASHINGTON

January 30, 1926.

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4455

Monterey Bay, California

Surveyed in 1924 - 1925

Instructions dated October 6 and December 20, 1924.

Chief of Party, C. L. Garner.

Surveyed by party of Steamer DISCOVERER

Protracted by C. Pierce.

Soundings plotted by L. S. Hubbard.

Verified and inked by A. L. Shalowitz.

*Memo -
An excellent example
of tube work -
JLG*

1. The records conform to the requirements of the General Instructions except that more bottom characteristics should have been taken. The records show that there was four feet of stray line between the tubes and the lead, but they do not make clear how this strayline was applied to the tube readings.

The report of the verifier notes defects in the sounding tube graphs. These defects necessitated the reduction and verification of the soundings in the office.

2. The plan and character of development satisfy the General Instructions.
3. The plan and extent of development satisfy the specific instructions.
4. The sounding line crossings are adequate.
5. The information is sufficient for drawing the usual depth curves.
6. The field plotting was completed to the extent prescribed in the General instructions. It was well done although there were some instances of erroneous plotting which indicated that the boat sheet was not consulted.

✓ Due to the corrections to soundings resulting from revisions of the graphs practically all the soundings on the sheet required correction.

7. The junction with the adjoining survey is adequate.
8. The descriptive report and a special report from the Chief of Party call attention to a constant difference between the charted soundings and those on this sheet. As this might indicate an erroneous tidal plane or systematic defects in sounding on either the old or new surveys a careful comparison was made between old original sheets and 4455.

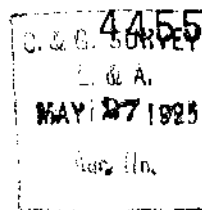
✓ H. 871 (1865) was the principal source for the area. 80% of soundings on 871 are within 5% of those on 4455, and the number deeper than 4455 are practically equal to those which are shoaler. 27 soundings on H. 558 (1856) lie within the area of 4455 and the agreement between the two is perfect throughout. There are 12 fugitive soundings (mostly Fish Commission) on the chart within the area of 4455 of which 8 are deeper and 4 shoaler than 4455.

✓ The study indicates that there are no systematic errors in either the old or new Coast Survey surveys, nor has there been any systematic change in the actual depths. All of them therefore may be used for charting.

9. The excellent results obtained by the use of tubes in this survey should be noted. The closeness of development (probably twice as many soundings as would have been obtained with the lead line) affords an admirable check on the accuracy of the soundings. The agreement at crossings and between adjacent soundings is remarkable. It leads the writer to believe that tubes, properly handled, will give a higher degree of accuracy than up and down casts between 20 and 100 fathoms. The economic superiority of tubes is, of course, unquestionable.
- ✓ 10. No further surveying is required.
11. The character and scope of the surveying and field drafting are excellent.
12. Reviewed by E. P. Ellis, January, 1926.

Approved -
A. L. G.
LOR

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY



HYDROGRAPHIC TITLE SHEET

The finished Hydrographic Sheet is to be accompanied by the following title sheet, filled in as completely as possible, when the sheet is forwarded to the Office.

U. S. Coast and Geodetic Survey.

Register No. (1) 4455

State . . . California

General locality . . . Monterey Bay

Locality . . . Pt. Santa Cruz to Vic. of Pt. Ano Nuevo

Locality . . . ~~Pigeon Pt. Lt. to Santa Cruz Lt.~~

Chief of party Clem L. Garner

Surveyed by Clem L. Garner

Date of survey . Nov. 24, 1924. - February 7, 1925.

Scale 1-40,000

Soundings in fathoms

Plane of reference . . . M.L.L.W.

Protracted by Ch. Pierce . . Soundings in pencil by L.S. Hubbard

Inked by Verified by

Records accompanying sheet (check those forwarded):

I Des. report, ☒ Tide books, ☐ Marigrams, ☐ Boat sheets, ☒

☒ Sounding books, ☐ Wire-drag books, ☐ Photographs.

Data from other sources affecting sheet

Remarks: